Anatomy in Long Clothes

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An Essay on Andreas Vesalius

BY

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CHICAGO
PRIVATELY PRINTED
MCMXV

Of this book one hundred copies have been made, none of which are for sale. Privately printed for Dr. Mortimer Frank, by Toby Rubovits, Chicago, Illinois, MCMXV.

This book is number_____

NOTE

This essay, *Anatomy in Long Clothes*, was contributed originally to *Fraser's Magazine* by Henry Morley in November, 1853. It has never been published since in its entirety, although it was used as a small chapter by Morley in the second volume of *Clement Marot and Other Studies* in 1871, under the title of Andreas Vesalius. In commemoration of the four hundredth anniversary of the birth of the great reformer of anatomy, it was thought that perhaps this excellent biography might appeal to a certain group of medical men, and so it has been put in book form for private circulation. The printer's mark at the end is that used by the publisher Oporinus for the first edition of the *Fabrica*, issued in 1543.

MORTIMER FRANK.

Anatomy in Long Clothes

THERE is an old folio, known to most men who have visited the fountain-heads of medical literature, and dear to bookworms for its woodcut illustrations, which in their own time were ascribed to Titian. It is the *Corporis Humani Fabrica* of Andreas Vesalius. The first page is adorned with a large and spirited woodcut, in which a young man, wearing professor's robes, is to be seen standing at the table of a lecture theatre, and pointing out from a robust subject that lies before him the inner secrets of the human body. The tiers of benches that surround the lecture-table are completely crowded with grave doctors, who are leaning forward, struggling to see, and even climbing upon railings, from which they look down with faces

that present a striking group, expressive of much wonder, interest, and curiosity, mixed with a little awe. And yet they look upon a spectacle which is presented in our day as a matter-of-course to thousands of young men during the winter session at the hospitals.

The woodcut at once leads us to suppose that we have to deal in the book to which it is prefixed with a man who was the first to force his way into a path obstructed by a heavy barricade of prejudice. If we turn over a leaf, we find his portrait in another sketch, rough, bold, and masterly. It portrays spirit and flesh of a young man who has the marks of a hardworking brain upon his forehead, and of a firm will upon his face. He looks like a man born to do work for the world, and not unwilling at the same time to take ease in it. He evidently can enjoy as well as think, and will, and do. His beard is very trim, his senses look acute, his rather handsome features express much refinement,

aptness also for a look of scorn. He shows like a chief in intellect, a gracious king over some region of knowledge, who possesses all he could inherit, and knows how to conquer more; a good companion to kindred minds when recognised among them as a leader. So we judge from the noble portrait of the young professor in his robes, Andrew Vesalius, aged, as we are told by the inscription on the border, twenty-eight; a man who at that age had already become the Luther of Anatomy.

We meet only occasionally with born poets and musicians. Vesalius had a native genius of a rarer kind—he was a born dissector. From the inspection of rats, moles, dogs, cats, monkeys, his mind rose, impatient of restraint, to a desire for a more exact knowledge than they or Galen gave of the anatomy of man. But in his day, to be dissatisfied with Galen was to be a heretic in medicine; and to touch with a scalpel the dead 'image of God' was

reckoned impious theology. There was no doubt left upon that latter point, for in the lifetime of Vesalius Charles the Fifth had brought the question formally before a consultation of divines at Salamanca. For purposes of ambition, living men might be blown asunder at the cannon's mouth, cut up with sword and axe, or probed into with military lances. For the purposes of science dead men were not to receive a wound.

Three weasels formed the family arms of Andreas, whose name was properly Wesalius, his forefathers having at one time belonged to Wesel, where they formed a portion of the noble Wittag family. The immediate progenitors of Andreas for several generations had been eminent for medical attainments. Peter Wesalius was a famous physician; John the son of Peter, another thriving doctor, had been physician to Mary of Burgundy, the first wife of Maximilian I. John, growing old, had re-

tired from business, not, however, until he had introduced Everard, his son, to his distinguished mistress, and to all his profitable practice. John, in retirement at Louvain, had written verses and enjoyed much honour: men of learning dedicated books to him. Everard had kept up the reputation of the family, had written Commentaries on the books of Rhases, and upon the Aphorisms of Hippocrates. The son of Everard, and the father of Andreas, enjoyed another reputation of the same kind: he was apothecary to the Emperor. The whole blood of the house was tinctured by this hereditary transmission through five generations of the same pursuit. When Andreas and his brother Francisco were destined to follow the two separate professions of medicine and law, their father found it very difficult to keep Francisco steady to his course of jurisprudence. Sending him out to study law his father found to be like throwing a ball against a blank

wall, he came regularly back upon his hand. When afterwards Francisco saw his famous brother very much attacked by Galenists, and indisposed to pay attention to them, there was nothing nearer to the heart of the young lawyer than a desire to fight his battles for him. The veins of the family, in fact, ran medicine. Andreas, when he was not fifteen years old, attended plague cases, and practised surgery.

The toils and trials of an anatomical enthusiast who did his own dark deeds, and begot light of them, three centuries ago, before the very threshold of the Inquisition, form a pleasant chapter in the history of modern science. But since it is a chapter very seldom read, we have considered it worth while to collect together its essential details, chiefly from the narrative of Boerhaave and Albinus, partly from certain dustier and older men, whose company is good because, although they are upon the

whole unquestionably tedious, they often have quaint facts to tell about the days in which they had their pleasure.

Andreas Vesalius was born on the last day of December, in the year 1514. His father, the apothecary, being attached to the service of Margaret, governor of the Netherlands, aunt of the Emperor Charles the Fifth, Andrew was born at Brussels. He was sent as a boy to study at Louvain, where he made very rapid progress in all branches of knowledge taught to him. He manifested a great taste for science, and spent all his leisure upon practical research into the mechanism of the lower animals. He became very proficient in the scholarship of the day, so that in his great work, written before he had allowed his skill to rust, the Latin style is singularly pure. Riolanus, who took pains afterwards to show that Vesalius was but a shallow fellow, and that his knowledge of anatomy in

particular was not much more than skin-deep, protested that he must have found some good scholar to write the Latin of his books. At the same time, however, that he might smite with a two-edged sword, the envious critic blamed the sentences of his opponent for their length, and its style for its obscurity; laying the law down, be it noted, in a style of his own ridiculously barbarous and complicated. The good Latin written by Vesalius while he was comparatively fresh from his studies at Louvain, became corrupted by disuse. The stagnant atmosphere of an Imperial court favoured the rotting of his scholarship. That Vesalius mastered not only Latin but Greek also, accurately, at Louvain, may be inferred from the fact that he wrote Greek annotations to the works of Galen. It is more certainly proved by the confidence with which the great Venetian printer, Aldinus Junta, in after years made application to Vesalius alone for a corrected text

of Galen, and for castigation of a Latin rendering of Galen's works. The application was in part only responded to.

Greek and Latin were sources of pleasure to the young anatomist only because they enabled him to read medical books. Then also, as he soon discovered the corruptness of translations generally, he was not content to study the Arabians by aid of their interpreters, but betook himself to a scholar learned in Arabic and Hebrew, Lazarus Hebræus de Frigeis. With that teacher he read Avicenna in the original Arabic, and afterwards was able to write for himself a paraphrase of the ten books of Rhases to the Emir Almansor.

From Louvain the youth was sent to Paris, where he studied physic under a most eminent physician, Jacobus Sylvius, otherwise Jacques de la Boë. Sylvius found his new pupil disagreeably acute. It was the practice of that illustrious Professor to read to his class Galen on the Use of Parts.

He began fairly, and when he had reached the middle of the first book, at the point where the anatomy commences, he said, 'Gentlemen, we now come to a part too difficult for the comprehension of beginners. Were I to go through it with you, we should only be bewildering each other.' To save trouble, therefore, the Professor took a flying leap over all intervening matter, and descended on the fifth book, through which he cantered quietly to the tenth section. From the rest of the work he made selections, to the consideration of which he either gave a single lecture, or to which he devoted five or six lessons at most. This course of professional study was illustrated sometimes with the dissection of some portion of a dog, prepared for the purpose by a surgeon under the Professor's eye. This always was thrown away on the third day, when it became unpleasant to the smell.

Sylvius believed, like his brethren, that the anatomy of all flesh was contained in Galen. If he found anything in his dog that puzzled him, the fault lay always with the animal; the dog was wrong. Often the learned man—more used to turn over leaves of books than strips of muscle—blundered about his little preparation, vainly searching for some bloodvessel or tendon that he meant to show. At the third of his practical demonstrations witnessed by Andreas, the teacher was so much surprised at the confused construction of the animal before him that he called upon the newcomer, whose passion for dissecting was well known, to help him through his difficulty. The Professor's patience was tried farther by the fact that Andreas Vesalius, by the intensity of his own enthusiasm, infected his companions with a pitiless zeal after correct details of anatomy. Whenever Sylvius, unable to find some vein or nerve, excused

its non-appearance and passed glibly on, he made work for his pupils. They slipped down when he was gone, hunted the dog through for the missing part, dissected it out for their master with great neatness, and triumphantly called his attention to it on his next appearance.

The influence of a commanding mind and of a strong enthusiasm was exercised over his associates in a yet more striking way by the ambitious student. He caused some of the young men to share his own impatience at the dog-anatomy to which they were confined. Pleasure loving youths, moved by his impulse, were to be found with him, haunting at ghostly hours the Cemetery of the Innocents. Once when he went with a fellow-pupil to the Montfaucon, where the bodies of executed criminals were deposited and bones were plentiful, they found themselves attacked by a pack of fierce dogs. Masters of the situation, they would by no means

let a bone be touched, and there ensued so hard a battle with them that the young anatomist believed the hour of fate was come. It seemed for a short time likely that, the tables being turned upon him, his own body would be dissected for the profit of that very class to which so many of his victims had belonged.

Another of the teachers under whom Andreas studied in Paris was a man of great renown, Gauthier d'Andernach, or to speak learnedly, Guintherius. He was physician in ordinary to King Francis I. Guintherius, before he went to Paris, had been Greek Professor at Louvain. At Paris he occasionally ventured so far as to dissect human beings. We run over three years to state here that in his *Institutiones Anatomicæ*, published in 1536, Guinther took occasion to specify Andreas Wesalius (the classic V had not at that time been adopted in the name) as a youth of great promise, Vesalius then being twenty-one years old. Again,

after three more years had elapsed, in publishing a new edition of his *Institutiones*, Guinther stated that he had been indebted largely to the helping hand of Andreas Vesalius, a youth most diligent in the study of Anatomy. The youth was then already himself beginning work upon a book that was to produce a revolution in the science.

At about the age of nineteen, however, the pupilage of Andreas at Paris, under Sylvius and Guinther, had been broken off by the French wars. He retired then to his alma mater at Louvain. Here continuing his studies, he for the first time openly demonstrated from the human subject, offering to the scholars of Louvain an unaccustomed spectacle. He had himself in Paris only twice been present at a demonstration of the kind.

During this sojourn at Louvain, it happened one day that Vesalius walked with his friend Gemma Frisius outside the gates. By accident their country ramble brought them to the

Tyburn of Louvain, the spot on which it was usual not only to execute criminals, but also to expose their bodies. It was a place of human bones, and of men's corpses in all stages of corruption. To such a spot the friends came very naturally, led to it no doubt by a familiar path, for where else was there a retired nook to be found of which the scenery was more completely in accordance with the taste of an anatomist. Vesalius loved nature with the ardour of true genius, but his love was not at all for—

> Russet lawns and fallows gray,
> Where the nibbling flocks do stray;
> Mountains, on whose barren breast
> The labouring clouds do often rest;
> Meadows trim, with daisies pied,
> Shallow brooks, and rivers wide;

He was a man who could have boiled his kettle with more pleasure in the valley of Jehoshaphat than in the vale of Tempe. Why should he not? Is the thighbone that propped up a lord of the creation less to be honoured than a primrose stalk? Or is the cup

that has contained the brain and wit of man to be regarded with less tender reverence than buttercups and pumpkins?

Vesalius and Gemma Frisius, whose humour it was to admire nature in the mechanism of the human body, looked at the dead men with learned eyes. The botanist a-field looks out for specimens to carry home, so the anatomist Vesalius looked greedily about him, for in such a place the obvious question was, could he make any little addition to his *hortus siccus* of odd joints and bones?

Now there had been executed on that spot a noted robber, who, since he deserved more than ordinary hanging, had been chained to the top of a high stake, and roasted alive. He had been roasted by a slow fire made of straw, that was kept burning at some distance below his feet. In that way there had been a dish cooked for the fowls of heaven, which had been regarded by them as a special dainty.

The sweet flesh of the delicately roasted thief they had preferred to every other; his bones, therefore, had been elaborately picked, and there was left suspended on the stake a skeleton dissected out and cleaned by many beaks with rare precision. The dazzling skeleton, complete and clean, was lifted up on high before the eyes of the anatomist, who had been striving hitherto to piece together such a thing out of the bones of many people, gathered as occasion offered. That was a flower to be plucked from its tall stem.

Mounting upon the shoulders of his friend, and aided by him from below, young Andreas ascended the charred stake, and tore away whatever bones he found accessible, breaking the ligaments which tied the legs and arms to the main trunk. The trunk itself was bound by iron chains so firmly to the stake, that it was left there hanging. With stolen bones under their clothes, the two young men returned into Louvain.

But in the evening Vesalius went out alone to take another walk, did not return in haste, and suffered the town gates to close against him. He had resolved to spend the night a-field under the stars; while honest men were sleeping in their beds he meant to share the vigil of the thieves. There was the trunk of the skeleton yet to be had. At midnight none would dare to brave the spectacle of fleshly horrors, to say nothing of such ghostly accidents as might befal them among corpses of the wicked, under rain, moon, stars, or flitting night-clouds. Certain, therefore, that no man would come to witness his offence, Vesalius at midnight again climbed the tree to gather its remaining blossom. By main force he deliberately wrested the whole set of bones out of the grasp of the great iron fetters, and then having removed his treasure to a secret spot, he buried it. In the morning he returned home empty-handed. At leisure then, and carefully, he smuggled through the

gates, day after day bone after bone. But when the perfect skeleton was set up in his own house, he did not scruple to display it openly, and to demonstrate from it, giving out that it had been brought by him to Louvain from Paris. The act of plunder was, however, too bold to escape attention. Vesalius afterwards was banished from Louvain for this offence.

In the next year, 1535, Andreas, having completed his twentieth year, served as a surgeon in the army of the Emperor, Charles V., during the Gallic war. He was then earning a salary, and finding subjects for dissection on the battle-field. Soon afterwards he went to Italy, making his head-quarters apparently at Venice, and displaying his zeal and ability as an anatomist by demonstrating publicly under the shadow of the most famous universities. Andreas Vesalius at once excited the attention of the learned men of Italy, as a remarkable youth of twenty-one or two, who could name, with his eyes

blindfolded, any, even the smallest, human bone put into his hand, who was versed deeply in comparative anatomy, and had more accurate and practical knowledge of the structure of the human frame than any greybeard of the time had dared to master. He was a youth who had turned all the ardour and passion of his age into the service of that one mysterious pursuit at which his neighbours shuddered and admired; a youth who was at the same time an able scholar, and who could declaim his knowledge in sound Latin from the lecture-table. The intensity of his zeal and his own habit of mastery won for him in Italy so prompt a recognition of his genius, that he was only twenty-two years old when he was offered (in 1537) a professorship at Padua, created for him. It was the first purely anatomical professorship, and in accepting it Vesalius became the first professor of anatomy who taught the science, and received a salary for so doing from the funds of any university.

A good deal of morbid curiosity, a corrupt taste for witnessing dissections of the human body as a novel spectacle, no doubt increased the number of the new professor's hearers. He was doing a bold thing, his lectures were a striking innovation on the tameness of conventional routine, and his fame grew with proportionate rapidity. He continued to hold his professorship at Padua during seven years, but he was at the same time professor in two other universities. He was sought by the academies for the same reason that causes an attractive performer to be sought at the same time by rival managers. Wherever he appeared, the theatre would fill. When already appointed at Padua, he was graced with a professorship also at Bologna, in which town he put together and compared the skeletons of a man and of a monkey. Being thus doubly a professor, he accepted also the urgent invitation of Cosmo, Duke of Florence, who desired that he should

take office as Professor of Anatomy at Pisa. Cosmo secured his man not only by offering a salary of six hundred crowns for a short course of demonstrations, but also by commanding that the authorities should furnish him with a free supply of bodies, whether from the cemetery or the scaffold. In each university the services of the professor were confined to a short course of demonstrations, so that his duties were complete when he had spent during the winter a few weeks at each of the three towns in succession. Then he returned to Venice.

At Venice, Andreas Vesalius studied indefatigably, at the same time that he practised physic. He not only solicited the bodies of condemned criminals, but also begged of magistrates that they would sentence such men to the modes of death that he from time to time suggested, in order that he might obtain physiological knowledge from his post mortem inspections. He was not afraid also

to beg that executions might be delayed when he was well supplied with subjects, so that there might be material for him to work upon at a more leisure time. Furthermore, he watched—and incited his pupils to watch—all the symptoms in men dying of a fatal malady, and it was usual with him and them to note where, after death, such men were buried. For their bodies night-visits were paid to the churchyard, either by Vesalius or by some of his disciples, and a diligent search was then made for the accurate determination of the cause of death. Many a corpse was in this way secretly conveyed by Andreas to his chamber, and concealed in his own bed.

At Padua and Bologna, where there was no bold Cosmo to back the teacher, no public means were ventured upon for the supply of the new lecture-table. It was supplied without trouble to Vesalius by the enthusiasm of the students, who became resurrectionists on his behalf. Thus it happened that on

one occasion his class was edified by the emotion of a portly Petrarch under a monk's hood, who had sought in the excitement of anatomy a refuge from his grief for the recent death of a too well-known Laura. He sat down thinking of his old acquaintance with a sigh,—

Mai non fu' in parte, ove si chiar vedessi
Quel, che veder vorrei, poi ch'io nol vidi,—

and started with a shout that betrayed all his secret when he saw her stretched out on the demonstrator's table. She had been disinterred by the students as a friendless person—one who in life had not regarded her own flesh as sacred, and whose body, therefore, might be lectured from without risk of exciting any active outcry against desecration of the dead. Vesalius, who hated monks as false pretenders and obstructors of sound knowledge, enjoyed greatly this dilemma.

During the first three years of office as professor, Andreas did not depart

or wish to depart from the approved rule of study. He praised the works of Galen in good faith, and made use of the anatomical writings of that ancient author as the text-book upon which he founded all his demonstrations. With practical experience, however, the conviction grew, not only that the anatomy of Galen was extremely incomplete, but that it was often wrong. He had marked down upon the margins of his text-book as he detected them many discrepancies between the text of Galen and the human body. These variations he found, as he went on, were constant. Then, dissecting lower animals, and monkeys more especially, he made comparison between their parts and corresponding parts in man, until he became convinced that Galen very rarely wrote from actual inspection of the human subject, that he had been a great anatomist, but that his teaching was based on a belief that the structure of a monkey was a direct copy of the structure of a man.

Galen had not ventured often to run counter to the tide of superstition, and defile himself by too close contact with the dead of his own race. This fact being ascertained with certainty, Vesalius took more than usual pains to note every discrepancy between the text of Galen and the actual parts which it endeavoured to describe. The list of these variations—annotations upon Galen—formed in a short time a volume of considerable thickness.

Having thus seen reason to distrust the foundations upon which the whole structure of medical science was, in his time, built, Vesalius, at the age of twenty-five, resolved to reconstruct more durably the science of anatomy. He perceived only one way in which this could be done: he would dissect minutely through the human body, and write down all that he found there carefully and accurately in a well-digested book. He would collate upon each point the evidence obtained under the scalpel with the writings of the authorities who occupied the

schools before him, would retain their nomenclature, and repeat their truths, but rectify their almost countless errors. To this bold enterprise, after his genius had once admitted the idea, Vesalius was further inpelled by the encouragement of his friends, and chiefly by the incitements of a colleague in the University of Padua, Mark Antony Genua, and of the patrician, Wolfgang Herwort. So it happened that, at the age of twenty-five, Andreas Vesalius, already a famous teacher, began to write, from actual scrutiny, his text-book of *The Fabric of the Human Body*. He at the same time practised medicine, and expressed loudly and often his regret that the art of healing and the science of anatomy were followed as two separate pursuits. He declared a correct knowledge of anatomy to be essential both to the physician and the surgeon, and he taught the science in his writings with a constant reference to medicine and surgery, bitterly ridiculing those practitioners who got their knowledge of disease out of a study of syrups.

It is possible to tell in a few paragraphs all that is known to have been done before the time of Vesalius for the promotion of the study of true human anatomy. In very ancient times it is proved that there was no lack of dissectors, those of the Alexandrine school used the knife freely on the human subject. Herophilus is said to have cut up and examined three hundred bodies, without reckoning his vivisections. Of the anatomy of the ancients, however, nothing has been transmitted except what has come down to us in the extant works of Galen. Galen, it has been shown, dissected lower animals and monkeys—rarely man. When contact with a corpse made expiations and ablutions necessary, it was not an easy thing to be an accurate anatomist. After the death of Galen that chief still continued to hold sway for centuries over the world of medicine. The Arabians put implicit faith in him, and copied all his errors, adding many of their own.

In the middle ages practical anatomy, when it attempted any inspection of 'the Divine image,' was regarded as impiety; nevertheless, a first step in a right direction was made by Mundinus, about the year 1315. Mundinus, professor of medicine at Bologna, between the years 1315-18, exhibited the public dissection of three bodies, and by so doing was the cause of a great scandal. Alarmed by an edict of Pope Boniface VII., he gave up his dangerous experiment, but he had published a work, *De Anatome*, containing much original matter, which was adopted by the learned world, and prescribed to be read in all academies.

For three centuries this work continued to be in force as an authority. In the time of Vesalius, Mundinus was read commonly as a supplement to the anatomy contained in Galen, and if any anatomist had new facts to record he edited Mundinus, and attached to the text of that author his own

experience in the form of commentary. In the year 1520, Mundinus had in that way been supplied with notes by Alessandro Achillino, and edited by his brother Philothes at Bologna, and in 1521 the book of Mundinus was again amply illustrated by Joannes Carpus Berengarius, the best of the precursors of Vesalius. Mundinus wrote succinctly, treating of parts in their natural order, but his information was not only succinct but also meagre; his style being obscure and barbarous, often incomprehensible, his errors many. His errors were so many that Matthew Curtius—who spoke before Vesalius had shaken the old paramount authority—said of Mundinus, 'all that is right in him is Galen's, but his own matter is always wrong.' Achillino was pronounced jejune, Berengarius diffuse, but really good. Carpus Berengarius introduced also into his edition, for the first time, pictures, by which the eye was enabled to comprehend the details given in the letterpress. The

pictures were rude, nineteen in number, increased in another publication, two years afterwards, to twenty-two. These plates deserve to be remembered by anatomists as the first efforts that were made to facilitate their studies by depicting as well as describing the construction of the human frame. In 1534, Albert Durer depicted the symmetry of the body in four books, but rather as an artist than as an anatomist. The greatest painters, protected by Julius II. and Leo X., had been allowed to study practically just so much anatomy as was required for the perfection of their art. Drawings from nature of the superficial muscles had been made by Leonardo da Vinci, Raffaelle, and Michael Angelo. Representations of the anatomy of deep-seated parts immediately preceding the publication of the plates issued by Vesalius, were edited in 1540 by Walter Hermann Ryff; and a more valuable set, in which the brain is well depicted, and its parts figured and named, was

published by Balthasar Pistor. None of these works were at all calculated to disturb the supremacy of Galen, or to create any revolution in anatomy. But they were indications of the ripeness of the field for work like that to which Vesalius devoted himself with the whole fresh zeal of youth, and all the vigour of his genius.

The income derived by Andreas from three professorships, and from his practice among the Venetians, perhaps also the prosperous worldly condition of his family, enabled him to expend money freely in the prosecution of his literary work. He took pains to secure, not only for his descriptions of parts, but also for the representations of them to be published in his book, the utmost possible fidelity and beauty. It cost him not a little to tempt able artists from their studies of the beautiful to sit and paint, day after day, from a dissected corpse. Grudging no cost, he succeeded so well as to obtain for his book anatomical plates, not only

incomparably better than any that had previously been published, but more excellent as works of art than very many that have appeared since his day. The chief artist engaged with him in this labour was Jean Calcar, native of Calcar, in the Duchy of Cleves. That artist studied during his best years in Italy, admiring chiefly the works of Raffaelle and Titian. He was one of the most able of Titian's pupils, and so accurately seized his master's style and manner, that many works from the hand of Calcar, portraits especially, have been attributed to Titian. Rubens kept, until his death, a Nativity by Calcar, that was remarkable for its effects of light; and Calcar is well known to many in our own day as the painter of the portraits which accompany Vasari's lives; Calcar, then, was the chief artist engaged upon the anatomical figures published by Vesalius, and this circumstance accounts for the fact that those figures were in their own time often attributed to Titian.,

While Andreas was steadily at work upon his book, author and artists (the other artists were Joannes Stephanus and Nicolo Stopio) making simultaneous progress, the first few plates were sent to the professor's father, who, it may be remembered, was apothecary to the Emperor. By him they were shown to Charles V., also to many of his most distinguished courtiers, and in this way the praise of the young anatomist first came to be spoken from imperial lips. In the year 1539, at the age of twenty-five, Vesalius issued to the public a few completed plates as an experiment. Being successful in Italy, they were largely pirated by German publishers, and many bad copies of these plates are therefore extant. The *Opus Magnum* was again to be preceded by another herald, an epitome of its six books, with illustrations of the choicest kind. In this epitome the matter was arranged and the plates were chosen with a direct intent to supply that kind of information wanted commonly by surgeons. The

chief care of the book was to describe and depict accurately those parts which are most frequently exposed to wounds, dislocations, tumours, and such ills of the flesh. It was to serve also as an index to the greater work. Although the epitome was finished first, and dedicated in due form to Philip, son and heir of the great Emperor, the actual publication of it was delayed until some months after the appearance of the full and perfect work, the *Corporis Humani Fabrica*, first published at Basle in the year 1543, its author being at that time twenty-eight years old.

With the famous treatise of Vesalius upon the fabric of the human body begins the history of anatomy as it is now studied. In that book the plates are throughout to the letter-press what the real subject is to the lecture of the demonstrator, and the references to the pictures are minute, distinct, and accurate. The groundwork of true human anatomy is laid throughout the book, with an exactness never before approached. The work is

strictly anatomical, but it includes many important references to the allied subjects of physiology and surgery. The descriptions of parts are given in well-polished Latin, with the clearness of a man who is quite master of his subject, and as he goes on, the author makes a merciless comparison between the structure that is really found in man, and the description of it found in Galen. He shows, finally, by cumulative proof, that Galen taught from a knowledge not of men but of brutes. Because, in showing this Vesalius proved the errors not only of Galen but of the whole mass of his brethren who had gone to Galen only for their information, and whom he would compel to sit at his own feet for better knowledge, he knew well that he was provoking all the brotherhood to war; he therefore made his onslaught upon error in a fighting mood.

Old men were not willing to tolerate dictation from a boy of twenty-eight. Professors and physicians who main-

tained a reputation for wisdom in their universities and in the world by propping it up on an intimate acquaintance with the works of Galen, were not disposed to let their prop be struck away; they clung to it tenaciously. Sylvius at Paris was especially indignant at the scientific heresies of his late pupil; he attacked his book with violence. Vesalius, therefore, wrote to his old master a letter full of friendly feeling and respect, inquiring wherein he had been guilty of error. Sylvius replied to this that he liked his old pupil very well, and would be glad to call him friend, but that he could do so only on condition that he would show proper respect for Galen. If he failed in that, he was to expect no quarter either from Sylvius or any pupils of his school.

Soon after the publication of his work in 1543 the name of Andreas Vesalius had become widely known at Court as that of a man gifted with preternatural skill in the art of healing. In

the year 1546 Andreas went from Venice, then his home, in company with the Venetian ambassador, to Regenspurg, where he was to exercise his skill upon the Emperor, and from that date he was ranked among the Emperor's physicians. On his way to Regenspurg, he stopped for a short time at Basle, and there gave a few demonstrations from a skeleton prepared by himself, which upon leaving he presented to the university. The skeleton was hung up in the lecture-hall, with an inscription under it commemorating the event in this manner:—

ANDREAS VESALIUS BRUXELLENS.
CAROLI V. AVG. ARCHIATRUS
LAUDATISS. ANATOMICARUM
ADMINISTR. COMM.
IN HAC URBE REGIA
PUBLICATURUS
VIRILE QUOD CERNIS SCELETON
ARTIS ET INDUSTRIÆ SUÆ
SPECIMEN
ANNO CHRISTIANO
1546
EXHIBUIT EREXITQUE.

This skeleton, prepared and presented to its anatomical school by the father of modern anatomy, still continues to be one of the curiosities of Basle.

From the Emperor, Vesalius was sent in the same year to attend one of his nobles. Afterwards at Ratisbon he wrote and published (still in 1546) one of his works, a long letter to Joachim Roelants, entitled, *De Usu Radicis Chinæ*. In that work, while he professed to treat of the medicine by which the Emperor's health had been restored, he entered largely into a vindication of his teaching against all assailants, and a fresh exposition of the fact that Galen had dissected brutes alone. The letter, of which the greater part was devoted to the business of self-assertion, contains much autobiographic matter, and is the source from which many of the preceding details have been drawn.

Returning then to Italy—his age being thirty-two—Andreas again taught and dissected publicly at Bologna,

Padua, and Pisa. His object was to battle against opposition from the orthodox. With few exceptions all the young men—all the next generation of physicians—declared themselves enthusiastically to be of the party of Vesalius. The old scholars and practitioners declared that innovator to be a mere infidel in anatomy, teaching a mass of errors. Vesalius, to put down these people, wrote always on the day before each of his demonstrations a public notice that it would take place, and that all men who decried his errors were invited to attend to make their own dissections from his subject, and confound him openly. Not a man ventured to accept the challenge, and in this way the opposition to Vesalius on the part of his immediate neighbours was held very much in check.

But from the old-fashioned teachers of the young in other towns—especially from Sylvius in Paris—the outcry against the heretic who had endeavoured to shake faith in

the word of Galen was incessant. In the year 1551 Sylvius broke out in print, his wrath was a long madness, and in his published lucubration the display of it runs to an excess that is quite pitiable. He accuses his old pupil—whom, by way of a dull, rude joke, he everywhere calls Vesanus—as a monster of ignorance, arrogance, and ingratitude—a man who poisoned Europe by the breath of his impiety, and who clouded knowledge by the infinitude of all his blunders. The animosity of Sylvius had become bitterly personal, and he even went so far as to accuse Andreas to the Emperor, and to seek an ally in one of the imperial physicians, Cornelius Barsdrop, whom he endeavoured to bribe not with money but with bones—namely, the skeleton of a child. All this hatred was not spent in vain. Sylvius was called upon, as a credible witness, to substantiate his charges, by exhibiting the errors of Vesalius from his own dissection of the subject. He

was unable to do so. The human body was perverse, and followed the descriptions of the heretic; but so completely was belief in Galen the religion of the old physicians, that Sylvius next declared the men of his own time to be constructed somewhat differently from the men who had lived so many centuries before. The ancients, at any rate, it was quite certain that Galen had dissected and described infallibly. Rather let him believe that God's work had been altered than that Galen had confounded men with monkeys.

The outcry raised against him by so many grave authorities did in effect create in many minds a vague dread of Vesalius and his writings. They fell into bad odour at Court; he performed wonderful cures, but when so much testimony went to show that the young man's writing was arrogant and impious, it was felt that it must be wrong to countenance his books. When, therefore, for the sake of his reputed skill

as a practitioner in medicine, Vesalius was called to reside permanently at Madrid, the summons was attended with so many circumstances showing the success of those who clamoured at his writings, that in a fit of proud indignation he spent one unlucky hour in burning all his manuscripts. Thus he destroyed a huge volume of annotations upon Galen—a whole book of medical formulæ—many original notes upon drugs—the copy of Galen from which he lectured, covered with marginal notes of new observations that had occurred to him while demonstrating—and the paraphrase of the books of Rhases, in which the knowledge of the Arabian was collated with that of the Greeks and others. The produce of the labour of many years was thus destroyed in a short fit of passion. While the ashes of his manuscripts were yet before him, Andreas repented of his deed.

He lived no more for science. As a Court physician at Madrid it was of

no use for Vesalius to teach anatomy to the inquisitors from bodies robbed out of the consecrated ground. He lived upon his reputation, and indulged in all the ease compatible with the stiff life of a Spanish courtier. There was a second (augmented) edition of his *Fabric of the Human Body*, published at Basle in 1555, but it was left for scholars and physicians to fight out among themselves the question of its merits. Vesalius was dead to controversy and to study, but alive to gain and pleasure. The reputation he enjoyed as a physician was unbounded. One instance of his wonderful sagacity is an instructive example of the growth of knowledge among men of the lancet. There is now scarcely one hospital pupil in his third year who would not be ashamed to fail in the diagnosis of an aneurismal tumour. Such a tumour on a patient—a big and wonderful tumour on the loins—puzzled two famous imperial physicians, Adolf Oceone and Achilles Piriminus. Vesalius being called

into consultation said: 'There is a blood-vessel dilated; that tumour is full of blood.' They were surprised at so strange an opinion, but the man died, the tumour was opened, blood was actually found in it, and we are told, *in admirationem rapti fuêre omnes.*

Another case was of a more startling kind, though not so creditable to the wit of the physician. In 1548 Maximilian d'Egmont, Count of Buren, a favourite general, was ill at Brussels. He had a disease of the heart, and Vesalius being called in not only said that he would die, but undertook also to predict the day and hour of death. In those days of astrology and superstition the habit of desiring and of hazarding predictions was extremely common. Vesalius had seldom risked his reputation by the use of them, but this one (as we hope he did not feel that it would do) brought its own fulfilment. The dread anticipation occupied the Count's mind. On the appointed day he called his relatives

and friends together to a feast, distributed gifts, declared his last wishes, took formal leave of all, waited with strong suppressed emotion for the appointed hour of death, and at the hour predicted actually died.

After the abdication of Charles V., Vesalius remained attached to the Court of Philip II. Don Carlos, Philip's son, having received a severe blow on the head, his life was despaired of till they called in Vesalius, who cut into the pericranium and relieved him promptly. Brother physicians, however, said even at Court, that Vesalius understood only superficial injuries, and could not cure internal disease. Vesalius replied easily that the world outside the profession had a different opinion, and that he had no reason to envy any doctor in the world the income he could make out of his skill. When Henry II. of France was lying mortally sick of his lance wound, it was Vesalius whom Philip of Spain sent to save him from the clutch of death. But it was

a long way from Madrid, and death was travelling much faster than the doctor.

The controversy concerning the infallibility of Galen was, in the meantime, raging with considerable violence. Renatus Henerus, a young man studying at Paris under Sylvius, felt annoyed at the incessant outcry against Vesalius, with which that professor was continually worrying his classes. He heard also that many sound and mature men disapproved of what, to his fresh heart, appeared very much like the bitterness of bigotry. Fuchs at Tübingen, Massa at Venice, and Rondolet at Montpellier, first-rate authorities, taught already without scruple many things that contradicted Galen. Henerus, finding this to be the case, determined on his own part to speak out on behalf of the too much abused reformer. He published, therefore, at Venice, in 1554, an apology for Vesalius, in which he spoke of Sylvius always with the respect due from a pupil to his

teacher, and declared that he had never seen the man whose reputation he defended. Among other attacks upon the great anatomist was one published in 1562 by Franciscus Puteus Vercellensis; but at that time Vesalius had shaken off a little of his lethargy, being apparently impressed with the belief that his fame was not secure. There appeared, therefore, a sharp reply to Francis Pluteus from a writer calling himself Gabriel Cuneus. That writer, Cardan, his contemporary and friend, with the best opportunities of knowing the truth, identifies with Andreas Vesalius himself. Internal evidence corroborates the statement of Cardan.

The fears of Vesalius concerning his good fame in the world of science had been excited in the year 1561, by the appearance of the *Anatomical Observations* of Fallopius. Gabriel Fallopius had been one of his pupils, and having mastered all the knowledge of his chief, had, from the advanced

point so attained, continued, with great skill and industry, to push forward the knowledge of anatomy. While the scalpel of Vesalius was rusting, Fallopius was making new researches, and when, in the year 1561, he published the results of his labours, after thirteen years of public teaching in Ferrara, and after having presided for eight years over an anatomical school, he was, of course, able to enlarge the borders of the science. With a temper that more suited the tone of feeling in a courtier than in a scholar, Vesalius regarded the advanced knowledge of his pupil as an infringement of his rights. Though he had been twenty years away from work as an anatomist, and had at that time in Madrid no opportunity of testing the discoveries of Fallopius by actual dissection, he wrote hastily an angry, wrong-headed reply, an *Examen Observationum Fallopii*, in which he decried the friend who made improvements on himself, as he had been himself decried for his

improvements upon Galen. The manuscript of this work, finished at the end of December, in the year 1561, Andreas committed to the care of Paulus Teupulus, of Venice, orator to the King of Spain, who was to give it to Fallopius. War, however, so far obstructed travelling that the orator did not reach Padua until after the death of Fallopius; he therefore very wisely retained and kept to himself all knowledge of the MS. Vesalius soon afterwards, on his way to Jerusalem, took possession of his work and caused it to be published without more delay. It appeared, therefore, at Venice in the year 1564.

The journey to Jerusalem, on which Vesalius set out from Madrid when in the full moon of his prosperity, is thus accounted for in a letter from Hubert Languet to Gasparus Teucerus:—'Vesalius, believing a young Spanish nobleman whom he had attended to be dead, obtained from his parents leave to open him, for the sake of inquiring into the real cause of his

illness, which he had not rightly comprehended. This was granted; but he had no sooner made a cut into the body than he perceived the symptoms of life, and opening the breast saw the heart beat. The parents coming afterwards to know of this, were not satisfied with prosecuting him for murder, but accused him of impiety to the Inquisition, in the hope that he would be punished with greater rigour by the judges of that tribunal than by those of the common law. But the King of Spain interfered and saved him, on condition, however, that by way of atonement he should make a pilgrimage to the Holy Land.'

Upon this part of the story Boerhaave and Albinus observe that the heart cannot well beat with life after so much dissection of the human frame as is necessary to expose it to the eye. It has been known, however, for centuries, that the irritability of muscles continues after death, differing in different parts, and may be excited mechanic-

ally by slight stimulus. The ventricles of the heart lose the contractile power within fifty minutes after death; but in the auricles it remains for hours; longer, indeed, than in any other muscle. Such facts had been observed even by Galen, who, perceiving that in the right auricle the power of contracting under stimulus remained longer than in any other portion of the body, described that part as the *ultimum moriens*—the last to die. Involuntary contraction of this kind may have helped in the ruin of Vesalius, or perhaps the priests, who had long watched their opportunity, took care to make the most of a mechanical gurgling in the body, or a chance movement occasioned by some shaking of the table, and contrived at last so to fix with a fatal weight the accusation of impiety upon the bold man who had so long set them at defiance. Imperialis ascribes the departure of Vesalius from Madrid to the cabals of jealousy, and Sweertius (*Athen. Belg.*), who may, perhaps, him-

self have been troubled with a crusty partner, declares that he went to Jerusalem in order to escape from the tormenting temper of his wife. It does not appear, however, that Vesalius was a married man.

Quitting Madrid for Venice, Andreas set out upon the next stage of his journey, from Venice to Cyprus, in company with Giacomo Malatesta di Rimini, general of the Venetian army. From Cyprus he went on to Jerusalem, and was returning, not to Madrid, but to the labours of his youth, as a professor at Padua, being invited by the Venetian Senate to occupy the chair of physic in that university, vacant by the death of Fallopius, when he was shipwrecked in the neighbourhood of Zante. Cast ashore upon that island, there he perished miserably, of hunger and grief, on the 15th of October of the year 1564, before he had quite reached the age of fifty. His body was found some days afterwards, in a miserable hut, by a travelling goldsmith,

who recognised in its starved outlines the features of the renowned Vesalius.

At the goldsmith's cost, therefore, the shipwrecked man was buried among strangers. After his death a great work on surgery appeared in seven books, signed with his name, and commonly included among his writings. There is reason, however, to believe that his name was stolen to give value to the book, which was compiled and published by a Venetian, Prosper Bogarucci, a literary crow, who fed himself upon the dead man's reputation.

VIRTVTI